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G4H

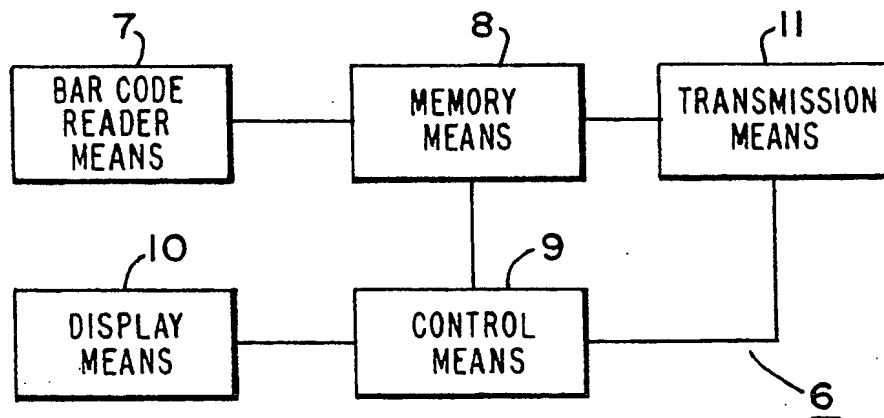
G3N

Selected US specifications from IPC sub-classes G08C
A47J F24C F24D

(54) Microwave oven with remote controller

(57) A microwave oven comprises an oven main body with a built-in heater unit and a remote controller (Fig. 2) which comprises a bar code reader 7 for reading a bar code of mutually related multiple data, a memory 8 for storing plural sets of the multiple data read by the bar code reader, a display device 10 for presenting the multiple data, a transmitting device 11 for sending to the oven main body the data selected from the plural sets of the multiple data stored in the memory, and a control unit 9 for data selection and transmission.

FIG.2.



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FIG. 1.

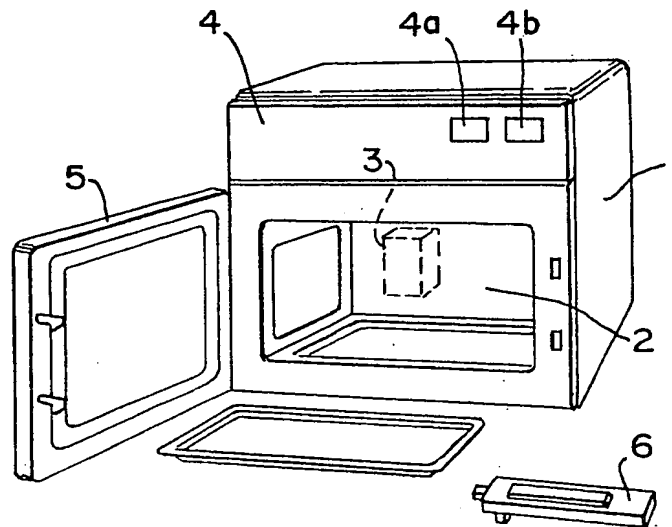


FIG. 2.

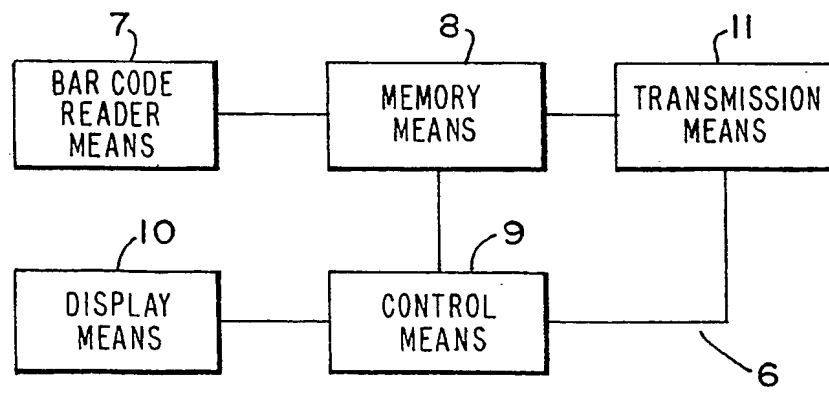


FIG. 4A.

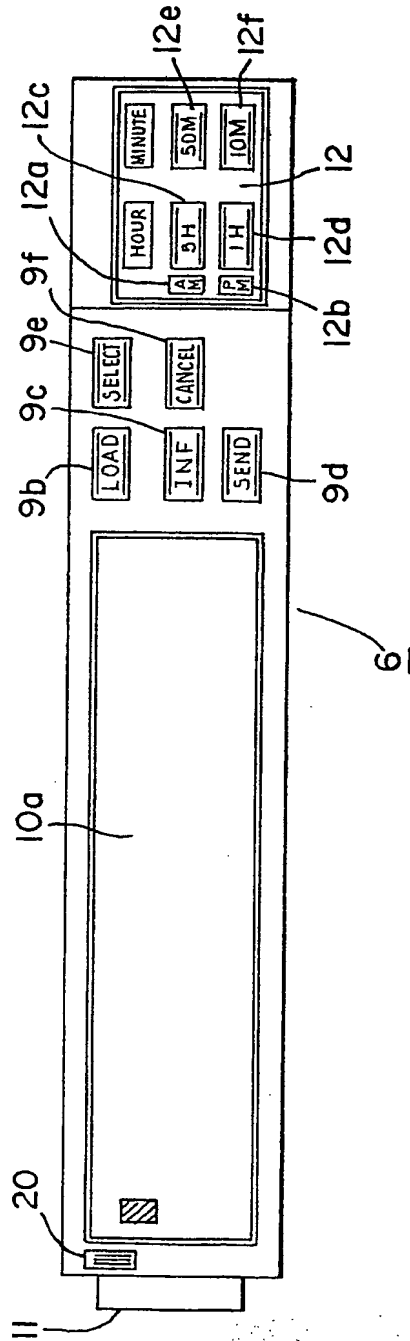


FIG. 3.

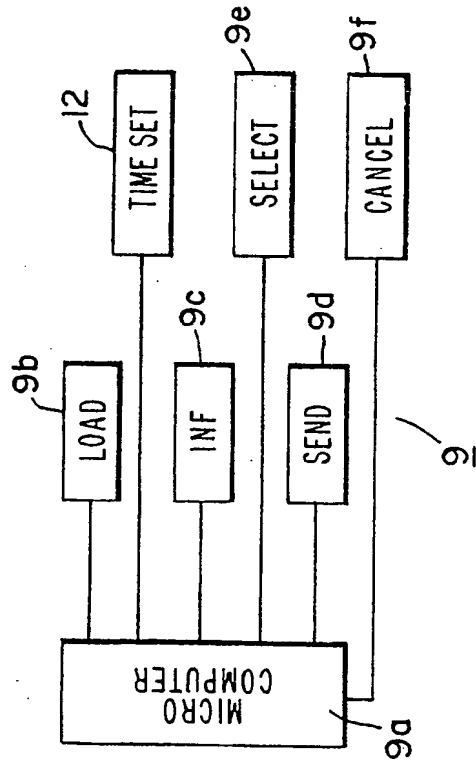


FIG. 4B.

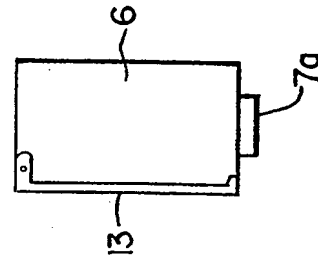
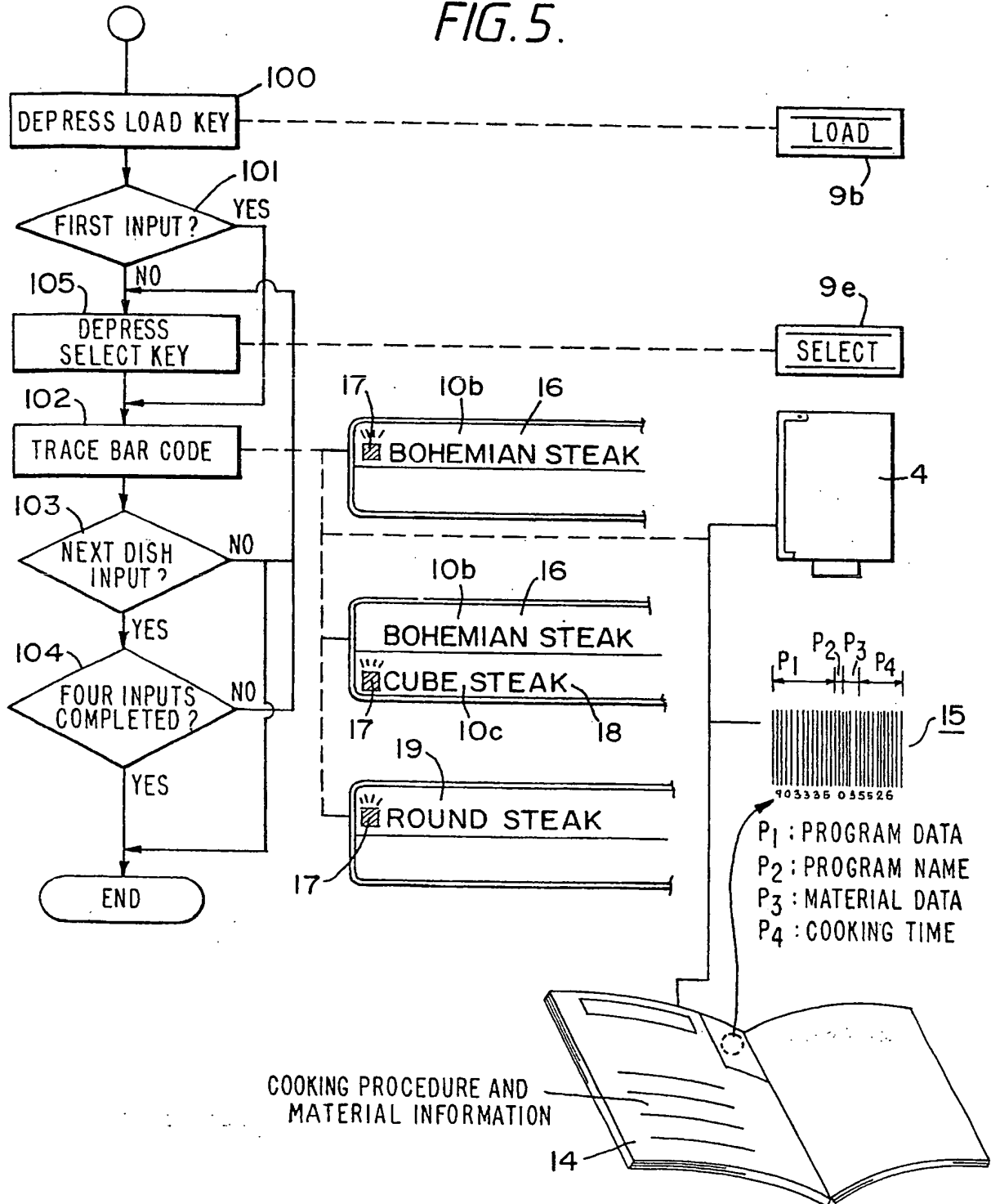


FIG. 5.



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FIG. 6.

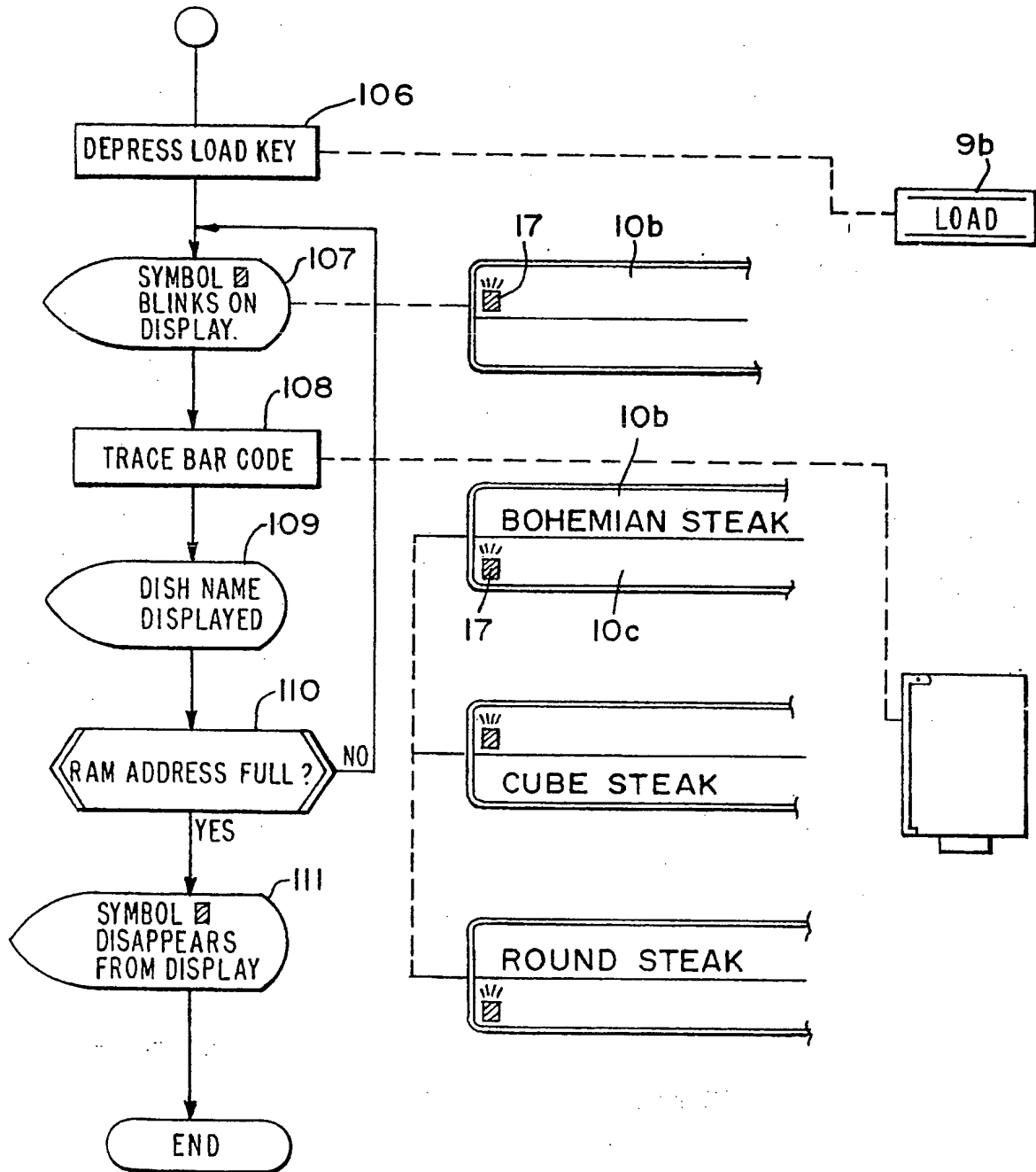


FIG. 7.

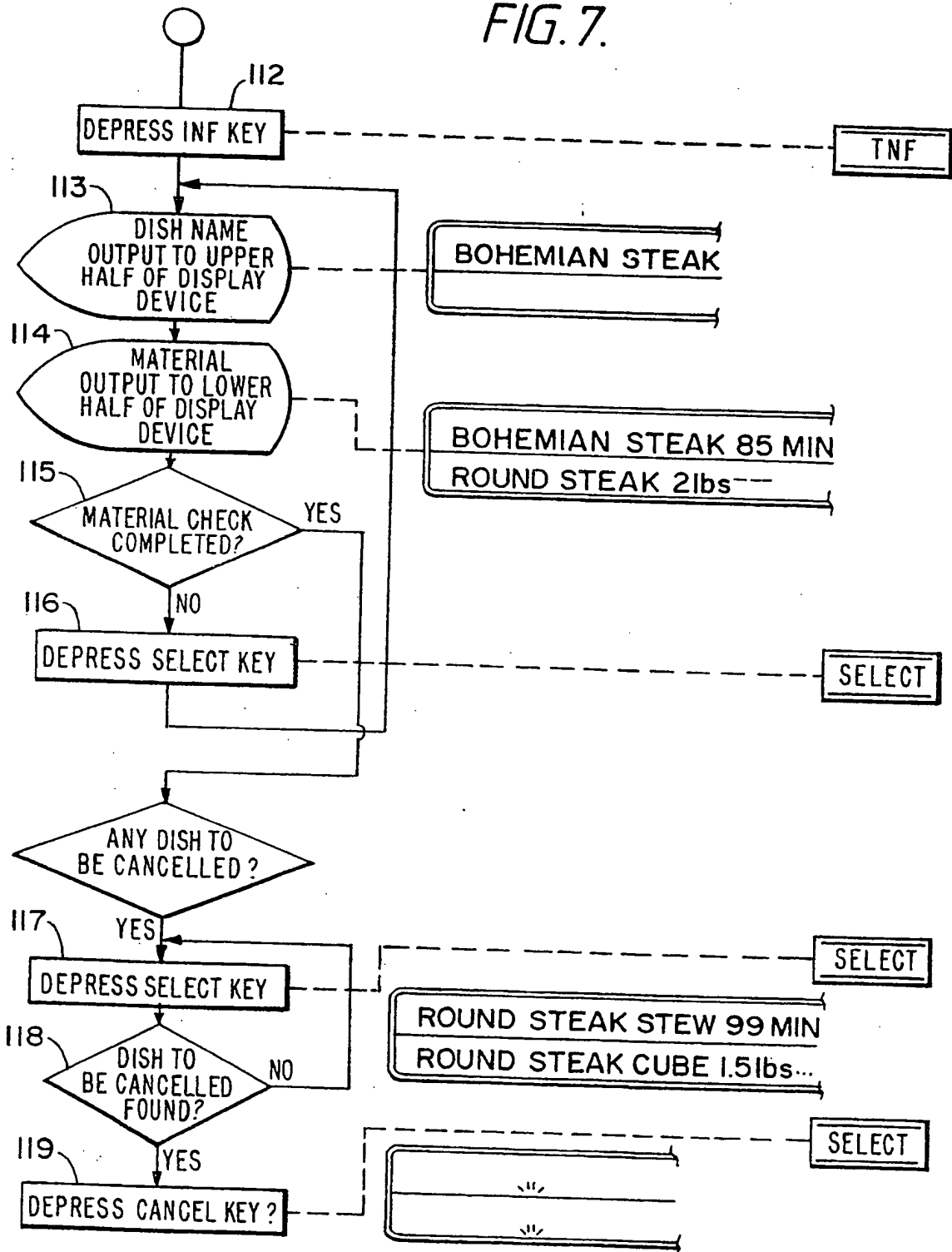
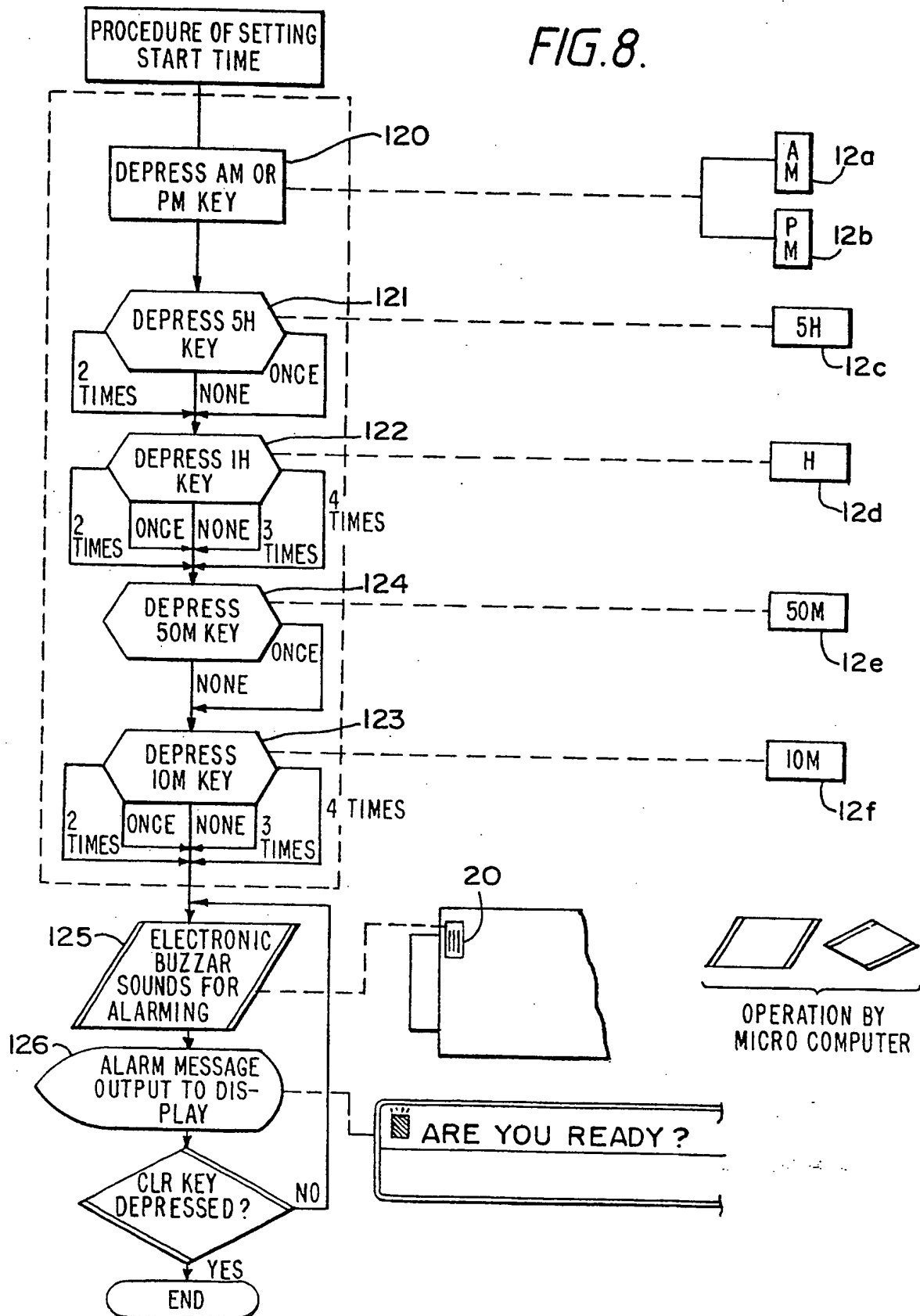


FIG. 8.



SPECIFICATION

Microwave oven with remote controller

5 *Background of the Invention*

The present invention relates to a microwave oven with a remote controller, or more specifically to a microwave oven whose remote controller incorporates bar code reading means to process multiple data related to cooking.

Bar code reading system which can input data properly in a moment by simple operation has been well known and had wide range of applications including "POS System" in the industry.

Cooking in a microwave oven requires lot of information. Some microwave ovens use bar code readers to input necessary information; cooking program data in form of bar code symbols are read by the bar code reader of a microwave oven remote controller and supplied in wireless method to the controller in the microwave oven main body.

An example of such a microwave oven is disclosed in the U.S. Patent Application Serial No. 855,496 filed by Kaoru EDAMURA under the title "ELECTRONICALLY CONTROLLED OVEN".

The microwave oven of the above application, however, only reads and supplies particular cooking program data to the oven main body. It is not provided with functions really demanded by users, that is, the function of reading such information as primary material and time required for cooking (the sum of heating time and average time for preliminary arrangement for cooking) for each of various dishes, and the function of supplying the oven main body with the information selected according to the material and time actually available for cooking. In other words, the oven disclosed in the above application cannot play any role in planning a menu.

45 *Summary of the Invention*

It is an object of the present invention to provide a microwave oven having a remote controller that stores information on a plurality of dishes, input from a bar code reader, and selects a particular data according to the requirements by the user, helping the user with menu planning.

More specifically, the object of this invention is to provide a microwave oven controlled by a separate portable remote controller which reads dish data such as primary material and cooking time requirement (the sum of heating time and average time for pre-arrangement) from a bar code and outputs them to display means as required by the user, thus allowing the electronic oven to participate in menu planning and to handle necessary data very easily.

65 Other objects and further scope of applica-

bility of the present invention will become apparent from the detailed description given hereinafter. It should be understood, however, that the detailed description and specific

70 examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

The present invention comprises an oven main body containing a heater unit, and a remote controller for giving instructions on cooking operation from a remote place. The remote controller comprises means for reading bar codes comprising mutually related multiple data, memory means for storing a plural sets of the multiple data read by the bar code reading means, means for displaying multiple data, transmission means for sending to the oven main body data selected from the plural sets of stored multiple data, and means for controlling data selection, cancellation and transmission.

90 Since any data stored can be displayed by operation of the control means for selection of necessary data from the plurality sets of multiple data read from the bar code reading means and stored in the memory means, the microwave oven of the present invention helps the user plan a menu.

Brief Description of the Drawings

The present invention will become more fully understood from the detailed description given thereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention and wherein:

105 *Figure 1* is a perspective view of an embodiment of the present invention;

Figure 2 is a block diagram of the remote controller of the embodiment;

110 *Figure 3* is a block diagram of the control means;

Figures 4A and 4B are a top view and a side view, respectively, of the remote controller; and

115 *Figures 5 through 8* are flow charts for explaining the operation sequences of the remote controller.

Detailed Description of the Invention

An embodiment of the present invention is now described with reference to the drawings. It should be noted that the invention is not limited by the embodiment presented below.

Referring to Fig. 1, an oven main body (1) comprises a heating chamber (2), a heater unit (3) composed of heating means such as magnetron (not shown), and a control unit (4) provided to control the heater unit (3). An oven door (5) is provided on the front of the oven main body (1) to tightly close the heating chamber (2). A remotod controller (6) sends

or receives signals in form of infrared ray to a receiver (4a) or from a transmitter (4b) both mounted in the control unit (4) of the oven main body (1).

5 Fig. 2 is a block diagram of the remote controller (6). The remote controller (6) comprises means (7) for reading a bar code comprising mutually related multiple information such as program data, dish name and its primary material, memory means (8) such as a RAM for storing read multiple data, means (9) for controlling data selection and transmission, display means (10) for presenting data selected by the control means (9) or data sequentially input to the remote controller (6), and transmission means (11) for sending to the control unit (4) the data selected from among a plural sets of multiple data stored in the memory means (8). The control means (9) comprises a micro computer (9a), a LOAD key switch (9b) for designating an operation mode of a microcomputer 9a, an information display (INF) key switch (9c), a send key switch (9d) for outputting signals to actuate the transmission means (11), a time set switch (12) for setting a desired time, a select key switch (9e) for sequentially designating addresses of the memory means (8) in outputting or inputting data, and a cancel key switch (9f) for deleting unnecessary data from the memory means (8). The bar code reading means (7) has a bar code reading section (7a) in the back of the remote controller (6). When the bar code reading section (7a) traces a bar code symbol provided for each dish on a microwave oven cooking book, the bar code reading means (7) sends to the memory means (8) electric signals of the dish data. The display means (10) visually presents the read data, the data stored in the memory means (8) and the data transmitted from the control unit (4), on a display window (10a) provided on the front of the remote controller (6). A dot matrix LCD is the most suitable for the display means. The transmission means (11) converts electric signals of dish data into a transmission medium such as infrared ray. A sealing panel (13) constitutes a part of the exterior of the remote controller (6), openably covering the time switch (12). It is usually closed to protect the time set switch (12) and conceal it from the user, making the construction of the remote controller (6) look simple.

Now, the operation of the embodiment is described in terms of operation sequence by users, with reference to Figs. 5 through 8.

Fig. 5 shows the flow chart of operation sequence for inputting a plurality of dish data successively (Case 1). (In this embodiment, it is assumed that up to four dish data can be input successively.)

First the LOAD key switch (9b) is operated (depressed) (Step 100). This operation sets the micro computer (9a) in the bar code symbol reading mode. If it is the first input oper-

ation (Step 101), a bar code symbol (15) is traced on a cooking book (14) which introduces cooking procedures, material and other information of dishes (Step 102). Each bar code symbol comprises four blocks P1 through P4: the block P1 for program-related data, P2 following the P1 for the dish name, P3 following the P2 for material and P4 for time required for cooking the dish (the sum of heating time and average time for preliminary arrangement). The program-related data may be any one of a program-specifying code, a program itself and an address where the appropriate program is stored. When a bar code symbol is traced, the read dish name (16) such as "BOHEMIAN STEAK" appears on the display window (10a) with a symbol (17) blinking at the head of the dish name. If input is to be made for the next dish (Step 103), the select key switch (9e) is depressed (Step 105) to designate the next address unless four inputs have already been made. Then the dish name (16) of the last input is displayed in the upper half zone (10b) of the display window (10a) and the dish name (18) of the new input displayed in the lower half zone (10c). The symbol (17) blinks at the head of the newly input dish name (18). Thus, while the names of two dishes (16) and (18) are displayed simultaneously, the symbol (17) helps identify which of the two dishes is input later. The select key switch (9e) is depressed for each input until data of four dishes have been input. When the third input operation is completed, the dish names (16) and (18) of the first and second inputs disappear, and the dish name (19) of the third input is displayed with the symbol (17) blinking at the front in the upper half zone (10b) of the display window (10a).

Fig. 6 shows the operation sequence for continuous input in which the micro computer (9a) designates next address (updating) each time a bar code symbol (15) has been read (traced for input) (Case 2).

As in the Case 1, the LOAD key switch (9b) is depressed first (Step 106). This operation sets the micro computer (9a) in the reading mode so that the input control is executed. Then a symbol (17) blinks in the upper half zone (10b) of the display window (10a) (Step 107), demanding the user to input data. When the user traces a bar code symbol (Step 108), dish name (16) alone of the multiple data input is automatically output to the display window (10a) (Step 109), enabling the user to confirm the input data content. At this stage, the symbol (17) moves to the left end of the lower half zone (10c) of the display window (10a), urging the user to conduct the next input operation. At the end of the second input, the micro computer (9a), after making sure that some addresses still remain unoccupied in the memory means (8) (Step 110), deletes the dish name (16) of the first input and moves

the symbol (17) to the left end of the upper half zone (10b) of the display window (10a), demanding the next input operation. The lower half zone (10c) of the display window (10a)

5 presents the dish name (18) of the second input. The third and fourth inputs are made in the same sequence. When all the addresses provided for storing input data (four addresses in this embodiment) become full by the
10 fourth input, the symbol (17) disappears (Step 111), indicating that no more input is acceptable.

Fig. 7 shows a flow chart of operations for outputting to the display means (10) the material information of a dish, that is, the name and quantity of primary material used in the dish and, for cancelling unnecessary information from the memory means (8).

The information display key switch (INF key) 20 (9c) is depressed first (Step 112) for access to the first address. The content of the address or dish-related information is presented on the display window (10a); the dish name in the upper half zone (10b) and the name and
25 quantity of primary material and the time required for cooking the dish (the sum of heating time and average time for pre-arrangement) in the lower half zone (10c) (Step 113 and 114). After confirmation of the display
30 (Step 115), the select key switch (9e) is depressed (Step 116) if the second dish-related data is to be checked. Access is then made to the second address to display the content. The data in the first address is displayed
35 again by depressing the select key switch (9e) three times. Thus, reference data for dishes stored in the addresses of the memory means (8) are sequentially accessible by operation of the select key switch (9e).

40 In the course of sequentially checking dish-related data, if it is found that a particular data should be eliminated in view of material availability or cooking time requirement (the sum of heating time and average time for pre-arrangement), the select key switch (9e) is depressed (Step 117) for access to the address
45 where the dish data to be eliminated is stored (Step 118), to cancel the dish. After the dish name is displayed, the cancel key switch 9f is
50 depressed to cancel the dish related data.

Carrying the remote controller (6) to the market, the user can conduct the above operation as he or she makes a purchase, which reduces the time required for preparing a
55 meal.

To save the user's time, the remote controller (6) is provided with an alarming feature which, if the time to start preparing a dish has been set in advance on the basis of the time
60 requirement shown on the display window, actuates an electronic buzzer (20) to sound an alarm and outputs an alarm message to the display means (10) when the set time elapses.

Fig. 8 shows the operation procedure for
65 inputting the time to start preparing a dish.

Since the time set switch (12) is normally concealed behind the sealing panel (13), it is necessary to open the sealing panel (13) first. An AM key (12a) or a PM key (12b) is depressed depending whether the time to start
70 cooking is in the morning or in the afternoon (Step 120). The hour of the time is set by using a 5-hour set key (12c) and a 1-hour set key (12d) which are both step key switches.

75 Each depression of the 5-hour set key (12c) inputs five hours, and each depression of the 1-hour set key (12d) inputs one hour. The minute is set by using a 50-minute set key (12e) and a 10-minute set key (12f). Assuming 12:30 is to be set, for example, 12 hours is input by depressing the 5-hour set key (12c) two times (Step 121) and the 1-hour
80 set key (12d) two times (Step 122), and 30 minutes is input by depressing the 10-minute set key (12f) three times (Step 123). To input 50 minutes, the 50-minute set key (12e) should be used (Step 124). By the above key operation, the micro computer (9a) receives
85 input instructions (the results of addition in units of hour and minute) from the keys (12a) through (12f). In the above key operation, operations of the keys (12a) through (12f) are best combined so that the time can be set by the minimum number of key depressions.

95 When the time set the above operation has elapsed, the electronic buzzer (20) sounds an alarm (Step 125) and the display means (10) displays a message such as "ARE YOU READY?" (Step 126) to draw attention of the
100 user.

Transmission of program data is finally described.

Depression of the send key switch (9d) causes the micro computer (9a) to designate
105 the transmission mode. The select key switch (9e) is then depressed repeatedly until a desired dish name is displayed. This operation allows sequential access to the addresses storing program data and dish name in the memory means (8), so that the desired dish
110 name can be selected. When the desired dish name is displayed, the send key switch (9d) is depressed again to actuate the transmission means (11) to start sending signals.

115 The memory means (8) may be of a type integral with the micro computer (9a), like a RAM built in a single chip computer.

The microwave oven achieved by the present invention provides the following benefits
120 to users:

(I) Mutually related multiple information such as program data and reference data for each of various dishes is input all at once to the remote controller simply by tracing a bar code
125 symbol.

(II) The reference data input can be confirmed on the display means provided in the remote controller, by simple operation.

(III) The remote controller, which is a vital
130 part of the present invention, provides data

bank function. Specifically, the remote controller stores necessary information on a plurality of dishes picked up from among various dishes introduced in a cooking book. Carrying the remote controller to the market, the user can consult the reference data such as names and quantities of primary materials of the dishes as well as the time required for preparing the dishes (the sum of heating time and average time required for pre-arrangement) by outputting them on the display window.

Therefore, the remote controller serves as a shopping memo, permitting the user to select the most suitable dish from among the plurality of candidates according to the material availability and the time allowance.

The remote controller used in the microwave oven of the present invention assists the user not only in preparing dishes but also in planning a menu, so that the most optimum cooking operation as desired by the user can be realized.

While only certain embodiments of the present invention have been described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of the present invention as claimed.

30 CLAIMS

1. A microwave oven comprising: an oven main body with a built-in heater unit; and a remote controller comprising: means for reading a bar code of mutually related multiple data; memory means for storing a plural sets of said multiple data read by said bar code reading means; means for displaying said multiple data; transmission means for sending to the oven main body the data selected from the plural sets of said multiple data stored in said memory means; and means for controlling data selection and transmission.

2. A remote control unit for use with a cooking appliance, said unit including means for inputting and storing information relating to a dish to be cooked, means for displaying at least part of said information to the user, and means for transmitting at least part of said information to the cooking appliance for use therein in determining cooking parameters for cooking said dish.

3. A remote control unit according to claim 2 wherein said information inputting means comprises reading means adapted to read information codes.

4. A remote control unit according to claim 3 wherein said information codes are in graphic form.

5. A remote control unit according to claim 3 or claim 4 wherein said codes are bar codes.

6. A remote control unit according to any of claims 2 to 5 wherein said storing means is adapted to store information relating to a plurality of dishes, and wherein selection

means is provided for selecting the dish of which related information is to be transmitted to the cooking appliance.

7. A remote control unit according to claim 6 wherein said display means is capable of displaying information relating to more than one of said dishes.

8. A remote control unit according to any of claims 2 to 7 further including time setting means, the display means being operable in a time-setting operation to display the set time, and alarm means for providing a user-sensible alarm at the set time.

9. A remote control unit according to claim 3 or any claim dependent thereon, wherein said reading means is adapted to derive from a said information code first data indentifying the dish, second data indentifying one or more ingredients of the dish, third data identifying a dish preparation time and fourth data relating to a cooking program for said dish.

10. A remote control unit according to claim 9 wherein said transmitting means is adapted to transmit at least said fourth data for said dish, or for the selected dish, to the cooking appliance.

11. A cooking system in which coded information which relates to a dish and which is read and stored by a remote control unit includes ingredient and/or cooking time data as well as cooking program data to be sent to a cooking appliance for use in control of cooking of the dish.

12. A remote control unit for use with a cooking appliance, substantially as hereinbefore described with reference to Figs. 2 to 5, 7 and 8 of the accompanying drawings.

13. A remote control unit for use with a cooking appliance, substantially as hereinbefore described with reference to Figs. 2 to 4 and 6 to 8 of the accompanying drawings.

14. A cooking system comprising a remote control unit according to claim 12 or claim 13, in conjunction with an oven substantially as hereinbefore described with reference to Fig. 1 of the accompanying drawings.

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